



IN THE CLAIMS

Claim 1. (Currently Amended) An automatic transmission system for a vehicle, comprising:

an automatic transmission including a torque converter provided with a lockup clutch;

and

a controller that controls, while the vehicle is coasting in a fuel-cut state, an oil pressure of the lockup clutch through a feedback control using a hydraulic device so that a slip rotation speed of the lockup clutch matches a target slip rotation speed, wherein

the controller includes a calculation portion that calculates is adapted to calculate the slip rotation speed of the lockup clutch, and

a control portion that controls control the hydraulic device so that the oil pressure of the lockup clutch becomes constant if the slip rotation speed calculated by the calculation portion is greater than a predetermined rotation speed during a downshift of the automatic transmission, and controls the hydraulic device so that the slip rotation speed matches the predetermined slip rotation speed if the slip rotation speed calculated by the calculation portion is less than the predetermined slip rotation speed during the downshift of the automatic transmission.

Claim 2. (Cancelled).

Claim 3. (Currently Amended) An automatic transmission system for a vehicle, comprising:

an automatic transmission including a torque converter provided with a lockup clutch; and

a controller that controls, while the vehicle is coasting in a fuel-cut state, an oil pressure of the lockup clutch through a feedback control using a hydraulic device so that a slip rotation speed of the lockup clutch matches a target slip rotation speed, wherein

the controller includes a calculation portion that calculates is configured to calculate the slip rotation speed of the lockup clutch, and

[[set]] a setting portion that sets the slip rotation speed calculated by the calculation portion as the target slip rotation speed if the slip rotation speed calculated by the calculation portion is greater than a predetermined rotation speed during a downshift of the automatic transmission ~~the calculated slip rotation speed as the target slip rotation speed if a downshift of the automatic transmission is executed and sets the predetermined rotation speed as the target slip rotation speed if the slip rotation speed calculated by the calculation portion is less than the predetermined rotation speed during the downshift of the automatic transmission.~~

Claims 4-5. (Cancelled).

Claim 6. (Currently Amended) The automatic transmission system according to claim 3, wherein the controller [[is]] further includes a converging portion that, after the target slip rotation speed has been set by the setting portion, converges adapted to converge the target slip rotation speed to a target slip rotation speed of a steady coasting run if a predetermined converging condition is has been met.

Claim 7. (Original) A control apparatus for an automatic transmission for a vehicle including a torque converter provided with a lockup clutch, the control apparatus being able to control, while the vehicle is coasting in a fuel-cut state, an oil pressure of the lockup clutch

through a feedback control using a hydraulic device so that a slip rotation speed of the lockup clutch matches a target slip rotation speed, the control apparatus comprising:

calculation means for calculating the slip rotation speed of the lockup clutch; and
control means for controlling the hydraulic device so that the oil pressure of the lockup clutch becomes constant if the slip rotation speed calculated is greater than a predetermined rotation speed during a downshift.

Claim 8. (Original) A control apparatus for an automatic transmission for a vehicle including a torque converter provided with a lockup clutch, the control apparatus being able to control, while the vehicle is coasting in a fuel-cut state, an oil pressure of the lockup clutch through a feedback control using a hydraulic device so that a slip rotation speed of the lockup clutch matches a target slip rotation speed, and execute an oil pressure fixing control of fixing the oil pressure if a downshift of the automatic transmission is executed, the control apparatus comprising:

calculation means for calculating the slip rotation speed of the lockup clutch; and
stop means for stopping the oil pressure fixing control if the slip rotation speed calculated is less than a predetermined rotation speed while the oil pressure fixing control is being executed.

Claim 9. (Currently Amended) A control apparatus for an automatic transmission for a vehicle including a torque converter provided with a lockup clutch, the control apparatus being able to control, while the vehicle is coasting in a fuel-cut state, an oil pressure of the lockup clutch through a feedback control using a hydraulic device so that a slip rotation speed of the lockup clutch matches a target slip rotation speed, the control apparatus comprising:

calculation means for calculating the slip rotation speed of the lockup clutch; and

first rotation speed setting means for setting the calculated slip rotation speed as the target slip rotation speed if a downshift of the automatic transmission is executed the slip rotation speed calculated by the calculation means is greater than a predetermined rotation speed during a downshift of the automatic transmission and for setting the predetermined rotation speed as the target slip rotation speed if the slip rotation speed calculated by the calculation means is less than the predetermined rotation speed during the downshift of the automatic transmission.

Claim 10. (Withdrawn) A control method for controlling a lockup clutch of a torque converter while a vehicle equipped with an automatic transmission is coasting in a fuel-cut state, wherein an oil pressure of the lockup clutch is controlled through a feedback control so that a slip rotation speed of the lockup clutch matches a target slip rotation speed, the control method comprising the steps of:

calculating the slip rotation speed of the lockup clutch; and
controlling the oil pressure of the lockup clutch to be constant if the slip rotation speed calculated is greater than a predetermined rotation speed during a downshift.

Claim 11. (Withdrawn) A control method for controlling a lockup clutch of a torque converter while a vehicle equipped with an automatic transmission is coasting in a fuel-cut state, wherein an oil pressure of the lockup clutch is controlled through a feedback control so that a slip rotation speed of the lockup clutch matches a target slip rotation speed, the control method comprising the steps of:

executing an oil pressure fixing control of fixing the oil pressure if a downshift of the automatic transmission is executed;
calculating the slip rotation speed of the lockup clutch; and

stopping the oil pressure fixing control if the slip rotation speed calculated is less than a predetermined rotation speed while the oil pressure fixing control is being executed.

Claim 12. (Withdrawn) A control method for controlling a lockup clutch of a torque converter while a vehicle equipped with an automatic transmission is coasting in a fuel-cut state, wherein an oil pressure of the lockup clutch is controlled through a feedback control so that a slip rotation speed of the lockup clutch matches a target slip rotation speed, the control method comprising the steps of:

calculating the slip rotation speed of the lockup clutch; and
setting the calculated slip rotation speed as the target slip rotation speed if a downshift of the automatic transmission is executed.

Claim 13. (Withdrawn) The control method according to claim 12, wherein the calculated slip rotation speed is set as the target slip rotation speed if the calculated slip rotation speed is greater than a predetermined rotation speed during the downshift of the automatic transmission.

Claim 14. (Withdrawn) The control method according to claim 12, wherein the predetermined rotation speed is set as the target slip rotation speed if the calculated slip rotation speed is less than the predetermined rotation speed.

Claim 15. (Withdrawn) The control method according to claim 12, wherein the target slip rotation speed is set to a target slip rotation speed suitable for a steady coasting of the vehicle if a predetermined condition has been met.

Claim 16. (New) The automatic transmission system according to claim 1, wherein the control portion includes a setting portion that sets the slip rotation speed calculated by the calculation portion as the target slip rotation speed if the slip rotation speed calculated by the calculation portion is greater than a predetermined rotation speed during the downshift of the automatic transmission.

Claim 17. (New) An automatic transmission system for a vehicle, comprising:
an automatic transmission including a torque converter provided with a lockup clutch;
and
a controller that controls, while the vehicle is coasting in a fuel-cut state, an oil pressure of the lockup clutch through a feedback control using a hydraulic device so that a slip rotation speed of the lockup clutch matches a target slip rotation speed, wherein
the controller includes calculation means for calculating the slip rotation speed of the lockup clutch, and

control means for controlling the hydraulic device so that the oil pressure of the lockup clutch becomes constant if the slip rotation speed calculated by the calculation means is greater than a predetermined rotation speed during a downshift of the automatic transmission, and for controlling the hydraulic device so that the slip rotation speed matches the predetermined slip rotation speed if the slip rotation speed calculated by the calculation means is less than the predetermined slip rotation speed during the downshift of the automatic transmission.

Claim 18. (New) An automatic transmission system for a vehicle, comprising:
an automatic transmission including a torque converter provided with a lockup clutch;
and

a controller that controls, while the vehicle is coasting in a fuel-cut state, an oil pressure of the lockup clutch through a feedback control using a hydraulic device so that a slip rotation speed of the lockup clutch matches a target slip rotation speed, wherein

the controller includes calculation means for calculating the slip rotation speed of the lockup clutch, and

rotation speed setting means for setting the calculated slip rotation speed as the target slip rotation speed if the slip rotation speed calculated by the calculation means is greater than a predetermined rotation speed during a downshift of the automatic transmission and for setting the predetermined rotation speed as the target slip rotation speed if the slip rotation speed calculated by the calculation means is less than the predetermined rotation speed during the downshift of the automatic transmission.

Claim 19. (New) The automatic transmission system according to claim 18, wherein the controller further includes converging means that, after the target slip rotation speed has been set by the setting means, converges the target slip rotation speed to a target slip rotation speed of a steady coasting run if a predetermined converging condition is met.

Claim 20. (New) The automatic transmission system according to claim 17, wherein the control means includes setting means that sets the slip rotation speed calculated by the calculation portion as the target slip rotation speed if the slip rotation speed calculated by the calculation means is greater than a predetermined rotation speed during the downshift of the automatic transmission.

Claim 21 (New) The automatic transmission system according to claim 16, wherein the control portion sets the predetermined rotation speed as the target slip rotation speed if the

calculated slip rotation speed is less than the predetermined rotation speed during the downshift of the automatic transmission.

Claim 22 (New) The automatic transmission system according to claim 16, wherein the control portion further includes a converging portion that, after the target slip rotation speed has been set by the setting means, converges the target slip rotation speed to a target slip rotation speed of a steady coasting run if a predetermined converging condition is met.